August 5, 2016

To the Federal Communications Commission:

Re: Comments for Notice of Proposed Rulemaking RM-11708 in WT Docket No. 16-239

The notice of proposed rulemaking (NPRM) proposes to remove the baud rate and bandwidth of data signals in the HF bands, and seeks comments about if a bandwidth limit is required, as well as any economic consequences or benefits of its ruling (see Paragraphs 7, 8, footnote 28, footnote 37, Paragraph 10, and Paragraph 12). The FCC should recognize the important ramifications of this ruling, as it will impact the ability of the hundreds of thousands of narrowband operators to continue to enjoy the hobby if unlimited baud rate, unlimited bandwidth signals are allowed to operate in the same spectrum currently used by narrowband amateur operators. An unlimited bandwidth signal with unlimited baud rate will essentially allow wide walls of digital signals with arbitrarily large bandwidth to ride roughshod over narrowband signals. The FCC's NPRM was silent on the issue of interference, and should provide some governmental regulation to avoid the potentially disastrous situation where a regulatory framework would legally allow interference by unlimited bandwidth signal.

In its 1988 rulemaking, PR Docket 88-139, the FCC made a critical decision to separate transmission types so as *to relegate the transmission of certain inharmonious emission types to different segments of amateur service* (see NPRM at 2, footnote 8). Now, in 2016, the FCC should consider that a proposed unlimited baud rate and unlimited bandwidth signal is indeed a different and *inharmonious* type of emission than existing narrow band data transmissions used by hundreds of thousands of amateur operators. In the 28 years since rules were made for computer and data communication, we now live in a world with internet, wideband modems, and computer communications that are thousands of times faster than current regulations ever considered. Yet, the HF spectrum available to amateur operators has remained extremely limited in bandwidth. Thus, while I support the removal of a baud rate limit and a bandwidth limit, *this must only be done* if narrowband transmissions are given protected HF spectrum in the lower edge of the HF bands, where none of the newly proposed signals would operate or leak into. The proposed wideband data emissions, such as Pactor 4 and other serial tone modems, are inharmonious to narrow band transmissions that are used by the overwhelming majority of amateur operators in the RTTY/data portion of the HF bands. A great deal of evidence for this was offered in the comments to RM-11708, see particularly the vast majority of public comments filed after March 17, 2014.

The overwhelming majority of users in the RTTY/Data bands (e.g. the lower 100 kHz of every HF band -- except for 60 meters) utilize narrowband transmissions such as CW, RTTY, PSK31, and JT65. These narrowband transmissions do not occupy more than ~200 Hz of RF bandwidth, and certainly never more than 500 Hz of bandwidth (where bandwidth may be defined and measured as being 50 dB down from peak continuous wave power, or some other suitable definition). These types of narrow band operations enjoy national and global popularity because of their narrow bandwidths, since such narrow band signals enable better signal to noise ratio and thus greater communication reliability for a given set of equipment. Narrow band signals are completely incompatible with simultaneous operation of wideband signals, and are rendered useless when interfered with by wide band signals. As noted in Footnote 37 by Leslie and others, and in Paragraph 9, the FCC has never allowed 2.8 kHz SSB signals in the RTTY /data segment of HF, because wideband SSB signals are much wider and drown out narrowband signals, rendering the narrowband signals useless. As it does with SSB/Voice/Image signals, the Commission should similarly protect narrowband RTTY and data signals from the newly proposed wide band data signals that would not be limited in bandwidth or baud rate. Without a rule that expressly protects the narrowband users in sub bands at the low end of the HF bands, there will be chaos and interference created to current CW, RTTY, and other narrowband operators, not just in the US, but globally due to the long distance nature of HF propagation.

The evidence in the RM-11708 record (see, for example comments filed by Gerdes, White, Morrison, Muns, the undersigned, and hundreds of others) shows the vitality of narrow band CW and RTTY modes even in the no-code licensing era, and documents how wideband interference levels caused by the NPRM would render CW and RTTY unusable in the case of interfering wideband stations. Further, hundreds of commenters provided strong evidence of the already existing large amounts of interference that was experienced by amateurs attributed to existing automated wider-band data stations or HF mailboxes that are grandfathered in and allowed to use wider bandwidths while failing to listen-before-transmitting. The Commission should also recognize that there was a large amount of seemingly automated “ballot stuffing” in the early days of the RM 11708 FCC posting (presumably by an organized group or groups wishing to gain access to the protected CW/Data HF sub bands, see an analysis of comments provided by the undersigned). This body of evidence that pertains to interference, and the need for FCC regulation to protect narrow band operations, is part of the public record of RM-11708, and should be relied upon in the FCC deliberations for this NPRM. As noted above, the NPRM was completely silent on the interference problem, just as was the ARRL’s original petition (the word “interference” or the consideration of interference by the proposed elimination of baud rate and bandwidth was never addressed by the FCC in its NPRM, but it must be considered, since the amateur radio service is limited in spectrum and relies on regulation to ensure inharmonious transmission types do not interfere with one another).

Without interference protection, the wideband unlimited data emissions being proposed will overwhelm and eliminate the ability of current narrow band operators to enjoy the Amateur Radio Service. In light of the interference issues, the FCC should reconsider its tentative assumption in Paragraph 10 that no bandwidth limitation is needed. In response to the Commission's request for comment on an appropriate bandwidth limit in Paragraph 12 of the NPRM, I would urge the commission to require all data /RTTY signals to have an emitted RF bandwidth (50 dB down from peak, or 50 dB down from a CW tone in the center of the emitted pass band, or some other definition) no greater than 500 Hz in the lowest 100 kHz of every applicable HF band (e.g. 1800-1900 kHz, 3500-3600 kHz, 7000-7100 kHz, 14000-14100 kHz, 21000-21100 kHz, and 28000-28100 kHz, as well as the WARC bands). This would ensure harmonious narrow band signaling (having no more than 500 Hz RF bandwidth) in a protected lowest portion of the HF bands, and would eliminate the inevitable wideband interference on a global scale that would result without such a protected narrow band sub band. By restricting bandwidths and ensuring wide band emissions do not drown out narrowband emissions in the lower edge of the HF bands, the new types of experimental data signals may thrive, while not hampering the vast majority of RTTY/data users who use narrowband transmissions.

Regarding the Commission's request for economic impact in Paragraph 8, I am certain that if promulgated, the NPRM in its current state will have a significant detrimental economic impact on hundreds of thousands of amateur operators in the US who currently operate CW and RTTY. The cost of allowing the proposed "wideband" or "unlimited baud rate" signals to operate throughout the existing lower portions of the HF bands, without a protected sub bands, would be enormous. Today, hundreds of thousands of amateur operators enjoy narrowband CW or RTTY (for example, the Straight Key Century Club is a group of tens of thousands of amateur radio morse code enthusiasts: http://www.skccgroup.com/ --my SKCC number is 12,491). CW Ops is another amateur radio club that fosters morse code operation with membership numbers in the thousands if not tens of thousands http://www.cwops.org/ . All of the amateur operators who are members of these clubs, and in similar RTTY clubs, have invested in morse code equipment, electronic keyers, computer loggers, and narrow band filers in their equipment, and most enjoy the use of modest antennas that allow them to use the scarce HF spectrum for narrowband operation in the hobby for reliable communication. As was noted by hundreds of commenters in the RM-11708 proceeding (NPRM, footnote 1, particularly all comments filed after March 16, 2014), CW is the most reliable, least expensive mode of communication in an emergency. Thus, CW and RTTY, and other narrowband modes, must be guaranteed a portion of the HF spectrum where they are protected from wideband data modes. Many commenters specifically noted that the population of Pactor 4 and WinLink operators is, in proportion, *thousands of times smaller in number* than today's narrow band operator population. To give up all the existing narrow band protection (which today is inherent in the 300 baud rate limit) would be a grave economic injustice and bring vast interference to amateurs who have invested in equipment for narrow band data and RTTY.

The commission should note that the US is the 2nd largest amateur population with Japan being the largest. In Japan, narrowband modes on HF are specifically protected in their governmental amateur rules – the operation of 200 Hz wide bandwidth CW and data is specifically protected at the lower portion of the HF bands (generally the lowest 20-50 kHz of the HF band), and an emission bandwidth limit of 500 Hz is generally required up to 100 kHz from the lowest HF band edge. IARU Region 1 has comparable recommendations to protect narrow band signaling from wider bandwidth signals. This is presumably why the FCC and Japanese regulators have never allowed SSB (2.8 kHz bandwidth) transmissions to operate where these narrow band CW (data) and RTTY signals are allowed to operate. In enacting this NPRM, the FCC must protect the narrowband operations by assuring the lowest 100 kHz of every HF band will not be permitted to emit more than 500 Hz bandwidth signals, and that the newly proposed wideband digital data signals, having unlimited bandwidth and baud rate, will not leak or emit into the narrowband sub band that must be created.

Thank you for considering these comments, and considering the impact of interference and existing investments made by the amateur radio community for use in the precious and small HF allocations – please revise the NPRM accordingly to protect narrowband CW/data and RTTY in the lower sub bands.

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